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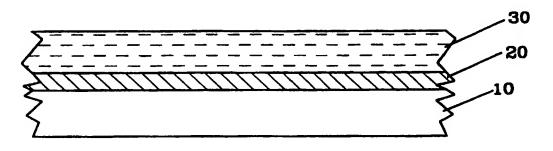
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(54) Title: LITHIUM ANODES FOR ELECTROCHEMICAL CELLS



(57) Abstract: Provided are anodes for use in electrochemical cells, wherein the anode comprises an anode active layer comprising lithium and a polymer anode substrate comprising a polymer film layer and a protective crosslinked polymer layer, in which the protective crosslinked polymer layer is in contact with the anode active layer on the side opposite to the surface in contact with the polymer film layer. The present invention also pertains to methods for forming such anodes and electrochemical cells comprising such anodes. The polymer film layer may be a terephthalate, a naphthalate, or an isophthalate, i.e. a polyester film. The protective crosslinked polymer layer may consist of acrylate polymer.



INTERNATION SEARCH REPORT

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A. CLASSI IPC 7	FICATION OF SUBJECT MATTER H01M4/02 H01M2/16			
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	ata base consulted during the international search (name of data ba	se and, where practical,	search terms used)	
C. DOCUME	ENTS CONSIDERED TO BE RELEVANT			
Category °	Citation of document, with indication, where appropriate, of the rel	levant passages		Relevant to claim No.
Х	US 5 478 676 A (TURI ERAN ET AL) 26 December 1995 (1995-12-26) abstract; figures 2,3 column 2, line 10 - line 17 column 3, line 7 -column 4, line column 4, line 44 - line 45; exam 12,14	6		12-14, 22,23
Y		-/		1-3,6,9
X Furth	ner documents are listed in the continuation of box C.	χ Patent family n	members are listed in	аппех.
"A" docume conside "E" earlier of filing de "L" docume which i citation "O" docume other n docume later th	ant defining the general state of the art which is not ered to be of particular relevance obcument but published on or after the international attent which may throw doubts on priority claim(s) or is cited to establish the publication date of another or or other special reason (as specified) and referring to an oral disclosure, use, exhibition or neans on the international filing date but an the priority date claimed	 *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. *&* document member of the same patent family 		
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	nailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk	Authorized officer		· = · · · · · · · · · · · · · · · · · ·
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INTERNATI AL SEARCH REPORT

l tional Application No PCT/US 01/49170

		PC1/US 01/491/0
	ation) DOCUMENTS CONSIDERED TO BE RELEVANT	· · · · · · · · · · · · · · · · · · ·
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Χ	US 4 615 961 A (PARK GEORGE B ET AL) 7 October 1986 (1986-10-07)	12,15, 19,20, 22,23
	abstract column 2, line 50 -column 3, line 27 column 4, line 21 - line 32 column 6, line 30 - line 55 column 8, line 11 - line 15	
Y	column 10, line 4 - line 8	1,6-9
X	US 5 066 554 A (HOPE HENRY F ET AL) 19 November 1991 (1991-11-19) abstract; figure 3	12,20, 22,23
Υ	column 2, line 14 - line 49	1,6-9
Υ	US 5 395 644 A (AFFINITO JOHN D) 7 March 1995 (1995-03-07) column 2, line 25 - line 27 column 3, line 49 -column 4, line 32 column 5, line 10 - line 37	1-3,6-9
A	US 6 277 514 B1 (YING QICONG ET AL) 21 August 2001 (2001-08-21) the whole document	22
		·

INTERNATION SEARCH REPORT

formation on patent family members

ional Application No PCT/US 01/49170

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Patent document cited in search report		Publication date		Patent family member(s)		Publication date
US 5478676	Α	26-12-1995	EP	0782771		09-07-1997
			JP	11505660	T	21-05-1999
			WO	9604689	A1	15-02-1996
US 4615961	Α	07-10-1986	AT	60464		15-02-1991
			AU	573637		16-06-1988
			AU	3496184		09-05-1985
			CA	1244876		15-11-1988
			DE	3484011		28-02-1991
			EP	0146246		26-06-1985
			GB	2149565		12-06-1985
			IL	73398		20-10-1987
			IN	163202		20-08-1988
			JP	60115156		21-06-1985
			ZA	8408594	υ 	30-07-1986
US 5066554	Α	19-11-1991	NONE	ــــــــــــــــــــــــــــــــــــــ		
US 5395644	Α	07-03-1995	US	5260095		09-11-1993
			US	5547508		20-08-1996
			AT	170779		15-09-1998
			CA	2142895		03-03-1994
			DE		D1	15-10-1998
			DE	69320971		27-05-1999
			DK		T3	07-06-1999
			EP	0655954		07-06-1995 02-04-1996
			JP NO	8503099 9404285		02-04-1990
			WO	9404265 		
US 6277514	B1	21-08-2001	US	6183901		06-02-2001
			US	6194098		27-02-2001
			AU	2196000		03-07-2000
			AU	2368100		03-07-2000
			CN	1334969	Ţ	06-02-2002
			CN	1334970		06-02-2002
			EP	1151486		07-11-2001
			EP	1149425		31-10-2001
				0000000	A 1	77 75 76 76 77
			WO	0036670		22-06-2000
			WO WO	0036671	A1	22-06-2000
			WO WO US	0036671 2001053475	A1 A1	22-06-2000 20-12-2001
			WO WO	0036671	A1 A1 A1	22-06-2000